

REMARKS

Claims 1-8, 19, 20, 31, 34 and 37-41 are pending in the present application. Claims 9-18, 21-30, 32, 33, 35 and 36 have been canceled by a previous amendment. Claims 1, 19, 20, 39 and 41 are independent. Reconsideration of this application, in view of the following remarks, is respectfully requested.

Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1-5, 7, 8, 19, 20, 31, 34 and 37-41 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Sano, U.S. Patent No. 6,264,097. Claims 1-8, 19, 20, 31, 34 and 37-41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pommer, U.S. Patent No. 5,839,188 in view of Huang et al., U.S. Patent No. 6,100,787 and Ciardella et al., U.S. Patent No. 5,711,989. These rejections are respectfully traversed.

At the outset, it is noted that a Declaration Under 37 C.F.R. § 1.131 is attached hereto for the Examiner's consideration. The attached Declaration antedates the Sano reference for the reasons set forth in the attached Declaration. Therefore, the Examiner's rejection under 35 U.S.C. § 102(b) has been rendered moot. Accordingly, only the Examiner's rejection under 35 U.S.C. § 103 will be discussed below.

The present invention is directed to a method of applying viscous medium onto a substrate. Independent claim 1 recites a combination of steps including "add-on jetting of predetermined additional amounts of viscous medium on predetermined positions on the screen printed substrate, said add-on jetting being performed without masking or stenciling." Independent claims 19, 20, 39

and 41 of the present invention are also directed to a method of applying viscous medium on a substrate. Independent claims 19 and 20 recite the step of “jetting additional viscous medium onto the substrate, said add-on jetting being performed without masking or stenciling.” Independent claim 39 of the present invention recites the step of “add-on jetting of individual droplets of viscous medium one drop at a time on predetermined positions on the screen printed substrate.” Independent claim 41 recites the step of “add-on jetting of solder paste on predetermined positions on the screen printed substrate.” Applicants respectfully submit that the references relied on by the Examiner fail to teach or suggest the presently claimed invention.

In particular, the Examiner relies on the Pommer reference to disclose the alternative use of “screen-printing or solder jetting” (see page 3, paragraph 4 of the Examiner’s Office Action). However, upon a review of the Pommer reference, Applicants could not determine where in the Pommer reference this teaching is disclosed. In view of this, it is requested that the Examiner clarify this in the next Official Communication.

Referring to the Pommer reference, column 10, lines 31-39 state the following:

Apertures 175 in layer 170 may be formed by drilling, punching, stamping, laser ablation, etc. Conductive material 176 may be deposited in the apertures by a number of processes, including electroplating, screen printing, ink jet printing, etc. The conductive material may be a metal such as copper, or may be a conductive ink (cured or uncured) or a fusible material such as solder particles. Two preferred manners include screen printing a fusible conductive ink, and ink jet printing fine solder particles. (emphasis added).

In view of the above, Pommer discloses “screen printing a fusible conductive ink” and “ink jet printing fine solder particles.” Applicants submit that fine solder particles are not solder paste as asserted by the Examiner. Therefore, Pommer fails to disclose ink jet printing solder paste as specifically recited in independent claim 41, for example.

In any event, the Examiner recognizes that Pommer fails to disclose the combination of screen printing and ink jet printing. However, the Examiner relies on the Huang et al. and Ciardella et al. references in order to modify Pommer to arrive at the presently claimed invention. Applicants respectfully submit that the modifications proposed by the Examiner would not have been obvious to one having ordinary skill in the art.

Because the Examiner's rejection is based on 35 U.S.C. §103, what is in issue in such a rejection is "the invention as a whole," not just a few features of the claimed invention. Under 35 U.S.C. §103, "[a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." The determination under §103 is whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. See In re O'Farrell, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). In determining obviousness, the invention must be considered as a whole and the claims must be considered in their entirety. See Medtronic, Inc. v. Cardiac Pacemakers, Inc., 721 F.2d 1563, 1567, 220 USPQ 97, 101 (Fed. Cir. 1983).

In rejecting claims under 35 U.S.C. §103, it is incumbent on the Examiner to establish a factual basis to support the legal conclusion of obviousness. See, In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one of ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must

stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal Inc. v. F-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a *prima facie* case of obviousness. Note, In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be suggested or taught by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1970). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

A suggestion, teaching, or motivation to combine the prior art references is an “essential evidentiary component of an obviousness holding.” C.R. Bard, Inc. v. M3 Sys. Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not “evidence.” See In re Dembiczak, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617 (Fed. Cir. 1999).

Moreover, it is well settled that the Office must provide objective evidence of the basis used in a prior art rejection. A factual inquiry whether to modify a reference must be based on objective

evidence of record, not merely conclusory statements of the Examiner. See, In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

Furthermore, during patent examination, the PTO bears the initial burden of presenting a *prima facie* case of unpatentability. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). If the PTO fails to meet this burden, then the Applicant is entitled to the patent. Only when a *prima facie* case is made, the burden shifts to the applicant to come forward to rebut such a case.

The Office Action clearly admits that Pommer fails to disclose the combination of screen printing and ink jet printing. In an attempt to remedy this admitted deficiency, the Office Action turns to the Huang et al. and Ciardella et al. references.

In the Examiner's Office Action, there are clear errors of fact that the Examiner is relying on as follows:

1). On page 3 of the Examiner's Office Action, fourth paragraph, the Examiner states "Huang teaches that screen-printing has the benefit of being a speedy process, but often leads to uneven coatings (column 1, lines 10-31)." However, referring to column 1, lines 10-31 of Huang et al., the following is stated:

The use of embedded resistors inside of multilayer ceramic packages is well known in the art. Typically, resistors are formed when thin layers of resistive paste are deposited between dielectric sheets of green ceramic tape. After lamination and firing, the embedded resistors are then formed inside the multilayer package. Embedded resistors may be used for biasing, voltage dividing, and termination applications. A major problem associated with conventional screen-printing of resistive paste on ceramic substrates to form resistors is that there is an unacceptable amount of variability in the resistance values in a fired package. This is in part due to the fact that a single layer of resistive paste is merely about 0.3 mils thick and can vary substantially depending upon processing techniques. Screen printing processing variability may be caused by a variety of factors such as uneven fixturing, uneven squeegee blade or

stroke, non-uniform viscosity of the paste composition, or other factors. As such, a fluctuation in the thickness of the printed film can result in a corresponding fluctuation in the amount of resistive paste deposited which necessarily effects resistance values in the resulting resistors. (emphasis added).

Referring to the above portion of Huang et al., there is no teaching of screen-printing being a speedy process. Therefore, it is requested that the Examiner clarify where Huang et al. discloses this in the next Official Communication. The Huang et al. reference relied on by the Examiner is directed to a multilayer ceramic package with low-variance embedded resistors. As mentioned by the Examiner, this reference does disclose that screen printing resistive paste can result in uneven applications of the resistive paste. In Huang et al., the problem of uneven application is addressed by completely re-designing the multilayer ceramic package. Specifically, in Huang et al., the problem of uneven application of the resistive paste is addressed by forming troughs 220 in the sheets 206 and 210 that are filled with the resistive paste during the screen printing process (see column 3, lines 14-16 of Huang et al.). Since the inclusion of the troughs results in a thicker layer of resistive paste, the variation in the application of the resistive paste has less of an effect on the resistance of the embedded resistor. In view of this, Huang et al. solves the problem of uneven application of the resistive paste by making the thickness greater. Taking this teaching into consideration, the only teaching that Huang et al. adds to Pommer is the avoidance of uneven application of resistive paste by increasing the thickness of the resistive paste. There is absolutely no teaching in the Huang et al. reference of the combination of screen printing and ink jet printing as in the presently claimed invention. Therefore, Huang et al. fails to make up for the admitted deficiency of Pommer.

2). On page 3 of the Examiner's Office Action, fourth paragraph, the Examiner states "... Ciardella discloses that solder jetting is a precise process, but is time consuming." Throughout the

disclosure of Ciardella et al., it is disclosed that the invention of Ciardella et al. is directed to high speed adhesive placement or viscous fluid dispensing. Contrary to what the Examiner asserts, Applicants could not find any teaching in Ciardella et al. that would indicate that solder jetting is a time consuming process. For example, in the "ABSTRACT" of Ciardella et al., it is indicated that the invention is directed to "a computer controlled method for high speed viscous fluid dispensing." In addition, at column 9, lines 57-59 it is stated "[o]ther types of viscous fluid may be rapidly dispensed, such as solder paste, potting compound and encapsulant." In view of this, it is requested that the Examiner clarify this in the next Official Communication.

In view of the above, the only teaching that Ciardella et al. adds to Pommer and/or Huang et al. is to use ink jet printing to apply a viscous medium. There is absolutely no suggestion in the Ciardella et al. reference of the combination of screen printing and ink jet printing as in the presently claimed invention. Therefore, Ciardella et al. fails to make up for the deficiencies of Pommer and Huang et al.

In summary, the Examiner's rejection relies on the Huang et al. and Ciardella et al. references to modify Pommer to use to combination of screen printing and ink jet printing. However, none of the Pommer, Huang et al. and Ciardella et al. references disclose the combination of screen printing and ink jet printing. Therefore, Applicants respectfully submit that the Examiner's rejection of independent claims 1, 19, 20, 39 and 41 is improper and should be withdrawn.

In view of the above, Applicant respectfully submits that the Office Action fails to provide objective factual evidence that one of ordinary skill in the art would be properly motivated to modify Pommer et al. in the manner suggested by the Examiner. Applicant respectfully submits that the only motivation to combine Pommer et al., Huang et al. and Ciardella et al. is found solely in Applicant's

disclosure, which cannot properly be used against Applicant as it constitutes improper hindsight reconstruction of Applicant's claimed invention.

A rejection must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of supplying the factual basis for the rejection advanced. The Examiner may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See, In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968). As such, the Examiner's rejection is fundamentally improper and should be withdrawn.

With regard to dependent claims 2-8, 31, 34, 37, 38 and 40, Applicants respectfully submit that these claims are allowable due to their respective dependence upon allowable independent claims 1 and 39, as well as due to the additional recitations in these claims.

In view of the above remarks, Applicants respectfully submit that claims 1-8, 19, 20, 31, 34 and 37-41 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiner's rejections under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

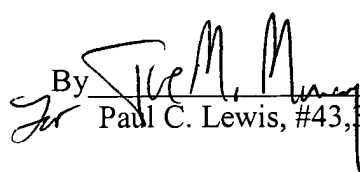
It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s)